UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

SP 1/15/2008

Application Number: 09/889,041
Filing Date: July 11, 2001
Appellant(s): HOLLIER ET AL.

Chris Comuntzis (Reg. No. 31,097) and Larry S. Nixon (Reg. No. 25,640)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on August 28, 2007 appealing from the Office

action mailed April 5, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

- Wolf, S., Pinson, M.,Webster, A., Cermak, G., Tweedy, E.P., "Objective and Subjective Measures of MPEG Video Quality," ANSI T1A1 contribution number T1A1.5/96-121, October 28, 1996.

- Westen, S.J.P., Lagendijk, R.L., Biemond, J., "Perceptual Image Quality Based on a Multiple Channel HVS Model", Acoustics, Speech, and Signal Processing, 1995. ICASSP-95., 1995 International Conference on, 9-12 May 1995, ISBN: 0-7803-2431-5.

- Bhaskaran, V., Konstantinides, K., Beretta, G., "Text and Image Sharpening of Scanned Images in the JPEG Domain", Image Processing, 1997. Proceedings., International Conference on, 26-29 Oct. 1997, INSPEC Accession Number:5899875.

5,550,580	ZHOU	8-1996

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

[R-1]   Claims 1-7 and 12-18 are rejected under 35 U.S.C. 102(b) as being anticipated by NPL

document titled "Committee T1 Performance Standards Contribution: Objective and Subjective

Measures of MPEG Video Quality" ("T1").

> Regarding claim 1, T1 meets all the claim limitations, as follows:
>
> > A method of measuring the differences between a first video signal and a second
> >
> > video signal *[Fig. 7]*, said method comprising: analyzing the information content of
> >
> > each video signal to identify the perceptually relevant boundaries *(i.e. edges)* of the
> >
> > video images depicted therein *[page 10, paragraphs 3 and 4]*; comparing boundaries so
> >
> > defined in the first signal (i.e. SI[input]) with those in the second (i.e. SI[output])
> >
> > signal *[page 13, paragraph 3]*, the comparison including determination of the extent to
> >
> > which the properties of the boundaries defined in the first image (i.e. SI[input]) are
> >
> > preserved in the second (i.e. SI[output]) *[page 13, paragraph 3]*; and generating an
> >
> > output (i.e. SI[error]) indicative of the perceptual difference between the first and
> >
> > second signals *[page 13, paragraph 3]*.

> Regarding claim 2, T1 meets all the claim limitations, as follows:
>
> > A method as in claim 1, in which the information content is analyzed for a plurality
> >
> > of boundary-identifying characteristics *[page 10, paragraph 3; three features]*, and the
> >
> > properties of boundaries on which the comparison is based include characteristics

(i.e. edges) by which such boundaries are defined in each of the signals *[page 10,*

paragraph 4].

Regarding claim 3, T1 meets all the claim limitations, as follows:

A method as in claim 2, wherein the characteristics include the presence of edges

[page 10, paragraph 4].

Regarding claim 4, T1 meets all the claim limitations, as follows:

A method as in claim 2, wherein the characteristics include the presence of

disparities (i.e. gradient) between frames of the same signal *[page 10, paragraph 4]*.

Regarding claim 5, T1 meets all the claim limitations, as follows:

A method as in claim 2, wherein the characteristics include changes in at least one of

the properties of: luminance, color or texture *[page 10, paragraphs 3 and 4: luminance]*.

Regarding claim 6, T1 meets all the claim limitations, as follows:

A method as in claim 1, in which the comparison includes a comparison of

perceptibility of corresponding boundaries identified in the first and second signals

[page 10, paragraph 3; page 13, paragraph 3].

Regarding claim 7, T1 meets all the claim limitations, as follows:

A method as in claim 1, in which the comparison of the images includes:

identification of the principal elements (i.e. ROI) in each image *[page 17, paragraph 6]*,

and compensation (i.e. calibration) for difference in the relative positions of said

principal elements *[page 21, paragraph 3]*.

Regarding claims 12-18 all claimed limitations are set forth and rejected as per discussion for

claims 1-7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[R-2]   Claims 8, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over T1 in

view of Westen et al. ("Westen") [NPL document titled, "Perceptual Image Quality Based on a

Multiple Channel HVS Model"].

Regarding claim 8, T1 discloses the following claim limitations:

A method as in claim 1, in which the analysis includes identification of perceptually

significant features *[page 10, paragraph 3 and 4]*, and

T1 does not explicitly disclose the following claim limitations:

the output indicative of perceptual difference between the first and second signals is

weighted according to the cognitive relevance of such image features.

However, in the same field of endeavor Westen discloses the deficient claim limitations, as

follows:

> the output indicative of perceptual difference between the first and second signals is
>
> weighted (i.e. masking) according to the cognitive relevance of such image features
>
> *[Fig. 1; page 2353, column 1, paragraph 3].*

T1 and Westen are combinable because they are from the same field of image quality

assessment.

It would have been obvious to one with ordinary skill in the art at the time of invention to

modify the teachings of T1 with Westen to include perceptual masking in quality assessment,

the motivation to incorporate visual content in quality assessment *[page 2351, column 1,*

paragraph 2].

Regarding claim 19, all claimed limitations are set forth and rejected as per discussion for

claim 8.

Regarding claim 20, T1 discloses the following claim limitations as set forth in claim 12.

T1 does not explicitly disclose the following claim limitations:

> Apparatus as in claim 12, further comprising visual stage means for processing
>
> original input signals to emulate the response of the human visual system and to
>
> generate modified input signals for input to the analysis means.

However, in the same field of endeavor Westen discloses the deficient claim limitations, as

follows:

Apparatus as in claim 12, further comprising visual stage means for processing

original input signals to emulate the response of the human visual system (i.e.

conversion to LBC) and to generate modified input signals for input to the analysis

means *[Figure 1; page 2351, col. 2, paragraphs 3 and 4]*.

T1 and Westen are combinable because they are from the same field of image quality

assessment.

It would have been obvious to one with ordinary skill in the art at the time of invention to

modify the teachings of T1 with Westen to emulate the response of human visual system,

the motivation to incorporate visual content in quality assessment *[page 2351, column 1,*

paragraph 2].

[R-3]   Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over T1 in view

Westen further in view of Zhou [US 5,550,580].

Regarding claim 9, T1 and Westen disclose the claim limitations as set forth in claim 8.

T1 and Westen do not explicitly disclose the following claim limitations:

A method as in claim 8, in which perceptually significant image features are those

characteristic of the human face.

However, in the same field of endeavor Zhou discloses the deficient claim limitations, as

follows:

A method as in claim 8, in which perceptually significant image features are those

characteristic of the human face *[Column 4 Lines 1-5]*.

T1, Westen and Zhou are combinable because they are from the same field of image

processing.

It would have been obvious to one with ordinary skill in the art at the time of invention to

modify the teachings of T1 and Westen with Zhou to identify the human face, the

motivation being viewer focus would be on the human face and quality defects would be

more perceptible in face region *[Column 4, Lines 1-5]*.

Regarding claim 10, Zhou meets all the claim limitations, as follows:

A method as in claim 9, in which a weighting is applied to the output according to

significance of the feature in providing visual cues to speech *[Column 4, Lines 6-14]*.

[R-4]   Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over T1 in view Westen

further in view of Bhaskaran et al. ("Bhaskaran") [NPL document titled, "Text and Image

Sharpening of Scanned Images in the JPEG Domain"].

Regarding claim 11, T1 and Westen disclose the claim limitations as set forth in claim 8.

T1 and Westen do not explicitly disclose the following claim limitations:

A method as in claim 8, in which perceptually significant image features are those by

which individual text characters are distinguished.

However, in the same field of endeavor Bhaskaran discloses the deficient claim limitations,

as follows:

>A method according to claim 8, in which perceptually significant image features are
>those by which individual text characters are distinguished *[Page 326, Column 1,
>Paragraph 3]*.

T1, Westen and Bhaskaran are combinable because they are from the same field of image

processing.

It would have been obvious to one with ordinary skill in the art at the time of invention to

modify the teachings of T1 and Westen with Bhaskaran to identify sharp edges, the

motivation being the improve image quality *[Page 326, Column 1, Paragraph 4]*.

(10) Response to Argument

Corrected arguments were filed in a supplemental appeal brief and the response below is directed to

the arguments presented in the supplemental appeal brief only.

Core Argument

Summary of Arguments:

Issue on appeal involves claim interpretation, more specifically for the phrase "perceptually

relevant boundaries".

Examiner's Response:

Examiner maintains that all edges meet the requirement of "perceptually relevant

boundaries" for at least for the following reasons:

1. First, the term "perceptually relevant" is highly subjective depending on

    whose perception is at issue. A computer system's perception is quite

different from that of a human and similarly a human's perception is quite

different from that of other animals.

2. Second, the term "perceptually relevant" is not a closed definition, there is no

terminology *in the claims* that define what constitutes a perceptually relevant

boundary and what does not.

3. Third, cited portions of the specification in the appeal brief disclose *only*

examples of what a "perceptually relevant boundaries" could be, but are not in

itself a closed definition.

Specific Arguments

Summary of Arguments:

Regarding claims 1-7, 12-18, applicant argues the following:

1. "Thus, each of the present claims requires an analysis process or apparatus that

identifies the information content of a video signal to identify the perceptually

relevant boundaries of the video images depicted therein. The Examiner erroneously

equates this analysis process or apparatus to identification of the edges by the prior

art T1 document but, as is described in detail in the present application, edges and

boundaries are not the same thing and, in many images, edges are not perceptually

relevant." Applicant supports this assertion with quotations from the specification,

"See Present Specification at page 4, line 22 to page 5, line 2. The identification of

the relevance of a particular boundary whether defined by a simple edge as in T1, or

by a change of texture, color or any other characteristic mentioned in the

specification is well documented throughout the present specification. See, in

addition to the above cited passage, *interalia,* the present specification at page 4, lines

7-21; page 5, line 3 to page 6, line 6; and page 6, line 15 to page 9, line 8." [Remarks:

Page 13, para. 2 and Page 14, para. 2].

2. "The cited T1 prior art, on the other hand, identifies all edges, whether or not

   perceptually relevant and, thus, does not teach or suggest the "analyzing" feature of

   Appellant's invention". [Remarks: page 14, para. 3]

3. "For example, dependent claims 5 and 16 further require that boundary identifying

   characteristics, determined by analyzing the information content of each video signal,

   include "changes in at least one of the properties of: luminance, color or texture."

   The T1 reference simply does not teach or suggest this further limitation, and the

   Examiner's citation to page 10 and paragraphs 3 and 4 of the cited reference does

   not provide any such teaching. In fact, nowhere does the T1 reference disclose

   analyzing boundary characteristics on the basis of luminance, color or texture to

   identify perceptually relevant boundaries of video images, as required by dependent

   clams 5 and 16." [Remarks: page 17, para. 1]

Examiner's Response:

Regarding claims 1-7, 12-18, Examiner contends the following:

1. Applicant states that "edges" and "boundaries" are not the same thing, but it is clear

   that applicant intends to encompass edges in the claim scope, see claim 3.

   Furthermore, the quotations provided only illustrate examples of a perceptually

   relevant boundaries, it does not provide a clear definition of perceptually relevant

boundaries. The reason being the threshold of perceptually relevant is vague and highly subjective depending on whose perception is at issue. A computer system's perception is quite different from that of a human and similarly a human's perception is quite different from that of other animals.

2. Examiner contends that if all edges were perceptually relevant boundaries (as is the case in T1), then merely identifying the edges would meet the "analyzing" limitation.

3. Edges are defined in T1 as differences (i.e. gradient) in luminance.
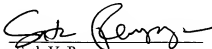
(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Dated: January 14, 2008

Respectfully submitted,
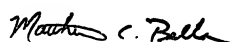
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